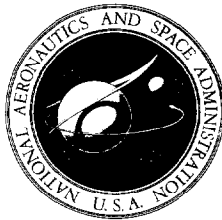


N A T I O N A L  
A E R O N A U T I C S  
A N D S P A C E  
A D M I N I S T R A T I O N



GODDARD SPACE FLIGHT CENTER  
GREENBELT, MARYLAND  
GRANITE 4-9000 TWX: BYN MD 867

IN REPLY REFER TO

SSD:613:LD:pa

January 31, 1961

Professor Joshua Lederberg  
Department of Genetics  
Medical Center, Stanford University  
Palo Alto, California

Dear Professor Lederberg:

Perhaps I can catch up with our exchange of correspondence which I regret I temporarily left up in the air since receipt of your letter of December 8, 1960. While excuses are frequently useless, they may at least indicate some of the projects with which we are occupied and may serve to illustrate those tools and bits of data in the field of ultraviolet technology which may also be of use in your program. We have been concerned with (not in order of importance or attention):

- (a) The measurement of multilayer dielectric filters for the middle ultraviolet.
- (b) The investigation of characteristics of alkali telluride photocathodes recently furnished to us in the form of simple photodiodes and photomultipliers.
- (c) Absolute photometry short of 3000A.
- (d) Preparation of a rocket experiment to determine directly by photoelectric photometry the solar flux at 2600A and 2200A.
- (e) Preparation and study of ion chambers in the region 1050A to 1400A with and for our colleagues who are in the midst of an interesting stellar flux survey rocket program.
- (f) Planning our ultraviolet airglow experimental program.
- (g) taking leave for the holidays.

- (h) Shoveling snow.
- (i) Enjoying the festivities (as you well know) of inauguration time.

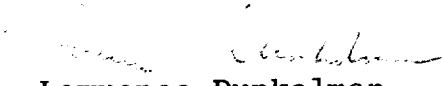
Now to get on with some unfinished replies which I'll take up in the order in which you raised the questions.

- (A) NRL Report 4647 (Refer your letter of Oct. 21, 1960). The nickel sulfate sorbital complex preparation did indeed involve a series of negative results but these negative results were not published and I expect they will not be. My notebooks had to remain at NRL and I have asked my former colleague, Donald Field of the Chemistry Division of NRL to look in the notebooks (especially his since he did the chemistry) and extract the negative highlights. I agree with you that negative results certainly can save further investigators a great deal of trouble. You will hear from him directly on this.
- (B) Nickel sulphate hexahydrate. The situation on this is excellent, thanks to Dr. William McBride of NOTS. We are enclosing several crystal discs similar to that which we fly in our UV rocket photometers.
- (C) Cellulose caprate. Don Field will shortly send you a jar of cellulose caprate granules and his report which will probably give you the information you need on its use as an optical cement.
- (D) A research associate with a strong background in optics and electronics. We are looking for the same type. We shall certainly steer those who prefer the West Coast, in your direction. I do not recall a Dr. Tanner and I can't think where our paths could have crossed. Relative to personnel recruitment we are actively looking for an airglowist.
- (E) I certainly found the documents which you enclosed with your letter of Oct. 21, 1960 most interesting. Without attempting to comment on your program and associated projects, I should like to say, at least, that obtaining the spectrum of the earth should be most interesting for its own sake and point up the problems involved in evaluating Mars, etc.

- (F) Hoshino - Yoshida filter. While I have been aware of their work, I have had no direct experience with it, particularly because our needs at that time required a very high rejection ratio rather than transmittances as high as 47%. I am enclosing several documents which will add to collection of information on selective UV band pass filters.
- (G) Image Intensifier Photographs (which you returned with your letter of December 8, 1960). The ERDL of Fort Belvoir were kind enough to make available additional copies so now I can send them back for your retention. I believe you'll be interested in having a report of the Bendix image intensifier project employing the channel electron multiplier. I am enclosing with Bendix report No. 1658 a copy of a forwarding memorandum I have sent to the members of the Ad Hoc Committee for the AEC on Image Intensifiers.
- (H) Vidicon system at threshold light intensities. (Your letter of October 31, 1960). I have checked with M. Klein your observation on a great increase in sensitivity of your vidicon system during transient adjustments of the target voltage. While neither he nor I have had such experience, however, Mr. Klein has observed this while working with the image orthicon. I may have more information when I see the members of the AEC Image Intensifier Committee later this week in New York where they are meeting during the Physical Society Meeting. Either I or someone else will comment further on your observation.

There are also rumblings from both astronomical and military circles which should lead to a Image Intensifier Symposium late this year. I'll keep you posted.

Sincerely yours,

  
Lawrence Dunkelman  
Head, Detector Section  
Astrophysics Branch

Enclosures:

Absorption Spectra of Halide Complexes of Cobalt (II) in Aqueous Solution by D. A. Fine - NAVWEPS Report 7590.

Photographs of M. Klein's paper on Image Intensifiers.

Enclosures (continued)

Final Report on Research on the Design and Development of a new Type of Image Intensifier - Bendix Report No. 1658 with L. Dunkelman memo to AEC Ad Hoc Committee on Image Intensifiers dated January 31, 1961.

Lectern draft of ICO5 paper on Spectrally Selective Ultraviolet Detectors (a few more details than given in original preprint which you have).

Baum and Dunkelman - J. Opt. Soc. Am 45, 166(1955).

Dunkelman and Scolnik - J. Opt. Soc. Am 49, 356(1959).

First and Second Bi-monthly Report from Bausch & Lomb (Turner & Bartle) on "R & D of Multilayer Dielectric Optical Filters for the Middle Ultraviolet."

Enclosure (separate cover)

Cellulose Caprate (500 gm) from NRL.

Two discs of  $\text{NiSO}_4 \cdot 6 \text{H}_2\text{O}$ .